# Volunteer Lake Assessment Program Individual Lake Reports

## OTTER POND, SUNAPEE, NH

**MORPHOMETRIC DATA**

| | | | | | |
|---|---|---|---|---|---|
| **Watershed Area (Ac.):** | 11,098 | **Max. Depth (m):** | 9.6 | **Flushing Rate (yr$^{-1}$):** | 8.1 |
| **Surface Area (Ac.):** | 185 | **Mean Depth (m):** | 3.8 | **P Retention Coef:** | 0.43 |
| **Shore Length (m):** | 4,800 | **Volume (m$^3$):** | 2,820,500 | **Elevation (ft):** | 1125 |

**TROPHIC CLASSIFICATION**

| Year | Trophic class |
|---|---|
| 2005 | MESOTROPHIC |
| 2008 | MESOTROPHIC |

**KNOWN EXOTIC SPECIES**

**The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.**

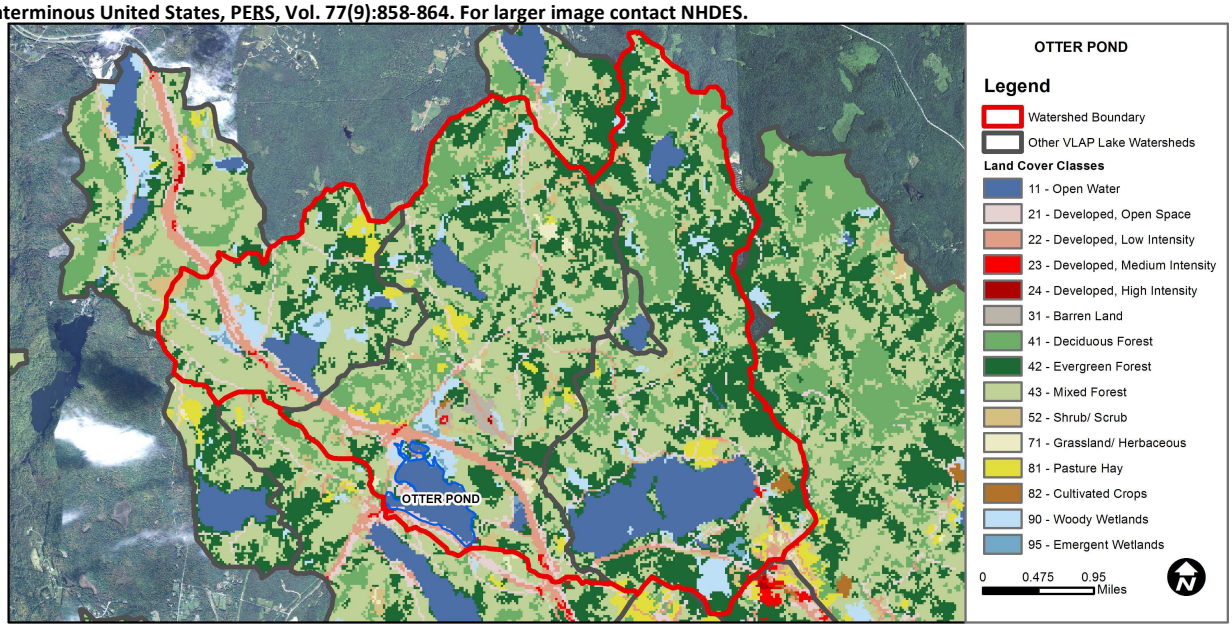
| Designated Use | Parameter | Category | Comments |
|---|---|---|---|
| Aquatic Life | Phosphorus (Total) | Good | >/=5 samples and median is < threshold but > 1/2 threshold value. |
| | pH | Slightly Bad | >10% of samples exceed criteria by a small margin (minimum of 2 exceedances). |
| | D.O. (mg/L) | Encouraging | < 10 samples and no exceedance of criteria. More data needed. |
| | D.O. (% sat) | Encouraging | < 10 samples and no exceedance of criteria. More data needed. |
| | Chlorophyll-a | Good | >/=5 samples and median is < threshold but > 1/2 threshold value. |
| Primary Contact Recreation | E. coli | Very Good | All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria. |
| | Chlorophyll-a | Very Good | At least 10 samples with 0 exceedances of criteria. |

**BEACH PRIMARY CONTACT ASSESSMENT STATUS**

| | | | |
|---|---|---|---|
| OTTER POND - MORGAN BEACH | E. coli | Bad | >/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria. |

**WATERSHED LAND USE SUMMARY**

**Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.**




| Land Cover Category | % Cover | Land Cover Category | % Cover | Land Cover Category | % Cover |
|---|---|---|---|---|---|
| Open Water | 9.34 | Barren Land | 0.52 | Grassland/Herbaceous | 0.45 |
| Developed-Open Space | 3.87 | Deciduous Forest | 11.3 | Pasture Hay | 1.84 |
| Developed-Low Intensity | 3.36 | Evergreen Forest | 25.39 | Cultivated Crops | 0.18 |
| Developed-Medium Intensity | 0.2 | Mixed Forest | 35.78 | Woody Wetlands | 4.18 |
| Developed-High Intensity | 0.01 | Shrub-Scrub | 2.01 | Emergent Wetlands | 0.31 |

# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
## OTTER POND, SUNAPEE, NH
## 2012 DATA SUMMARY

**OBSERVATIONS AND RECOMMENDATIONS** (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were low throughout the summer and less than the NH lake median. Historical trend analysis indicates a relatively stable trend since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels in Baptist Brook, Star Lake 2 and Little Sunapee Brook were greatly elevated in July, August and September likely due to dry conditions. Interstate 89 runs along the Eastern side of the pond and road salting contributes to elevated conductivity at these stations.
- **E. COLI:** E. coli levels were low and much less than state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus levels were slightly elevated in June but decreased in subsequent months. Historical trend analysis indicates epilimnetic phosphorus levels tend to fluctuate from year to year. Phosphorus levels in Little Sunapee Brook were elevated in July likely due to low water levels.
- **TRANSPARENCY:** Transparency remained stable throughout the summer. Historical trend analysis indicates a significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Turbidity was slightly elevated throughout the lake and tributary system. Deep spot turbidity has increased which likely caused the decreasing lake transparency.
- **PH:** pH levels tend to drop below desired ranges and can be critical to aquatic life.
- **RECOMMENDED ACTIONS:** The noticeable increase in turbidity in the lake is a concern along with the decreasing transparency. Stormwater runoff is likely transporting sediments into the pond from the surrounding watershed. Efforts should be made to identify potential areas of erosion and sedimentation. Best Management Practices (BMPs) should be implemented to reduce sedimentation during storm events.

Table 1. 2012 Average Water Quality Data for OTTER POND

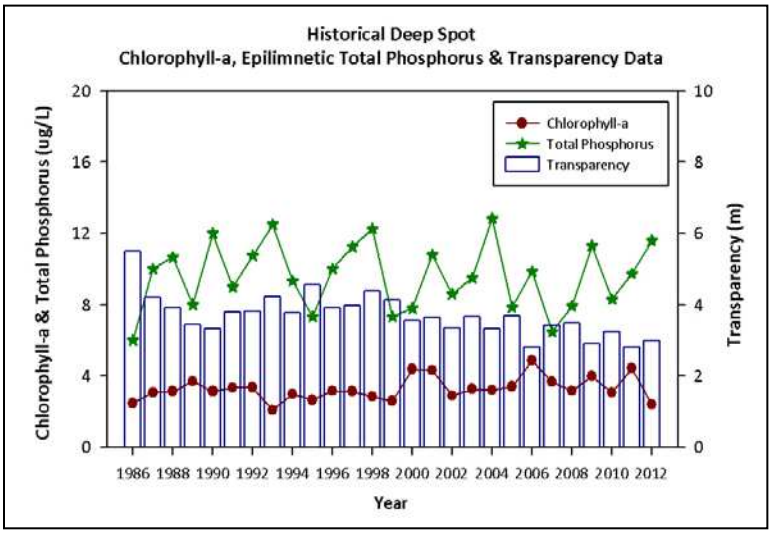
| Station Name | Alk. | Chlor-a | Cond. | E. Coli | Total P | Trans. | | Turb. | pH |
|---|---|---|---|---|---|---|---|---|---|
| | mg/l | ug/l | uS/cm | #/100ml | ug/l | m | | ntu | |
| | | | | | | NVS | VS | | |
| Baptist Brook | | | 351.9 | | 8 | | | 2.06 | 6.48 |
| Beach | | | | 2 | | | | | |
| Deep Epilimnion | 7.34 | 2.4 | 111.5 | | 12 | 3.00 | 3.27 | 1.58 | 6.67 |
| Deep Hypolimnion | | | 111.0 | | 10 | | | 1.47 | 6.57 |
| Little Sunapee Brook | | | 222.5 | | 14 | | | 1.09 | 6.64 |
| Outlet | | | 109.9 | | 9 | | | 1.40 | 6.65 |
| Star Lake 2 | | | 491.1 | | 16 | | | 4.33 | 6.31 |
| Star Lk Inlet | | | 103.3 | | 13 | | | 2.37 | 6.28 |

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.
**Alkalinity:** 4.9 mg/L
**Chlorophyll-a:** 4.58 mg/m$^3$
**Conductivity:** 40.0 uS/cm
**Chloride:** 4 mg/L
**Total Phosphorus:** 12 ug/L
**Transparency:** 3.2 m
**pH:** 6.6

**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
**Chloride:** < 230 mg/L (chronic)
**E. coli:** > 88 cts/100 mL – public beach
**E. coli:** > 406 cts/100 mL – surface waters
**Turbidity:** > 10 NTU above natural level
**pH:** 6.5-8.0 (unless naturally occurring)

### HISTORICAL WATER QUALITY TREND ANALYSIS

| Parameter | Trend | Explanation |
|---|---|---|
| Chlorophyll-a | Stable | Data not significantly increasing or decreasing. |
| Transparency | Degrading | Data significantly decreasing (worsening). |
| Phosphorus (epilimnion) | Variable | Data fluctuate annually, but are not significantly increasing or decreasing. |

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